

# PATENT SPECIFICATION

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## (54) TRANSPORT CARRIAGE HAVING WHEELS AND AN ARRANGEMENT OF SHELVES

(71) We, VARIANTSYSTEMET A/S, a Company organized under the Laws of Denmark of Fynsvej 60, DK-5500 Middelfart, Denmark, do hereby declare the invention, for which we pray that a Patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a transport carriage having wheels and an arrangement of shelves, and has specifically for its object to provide a construction of such a transport carriage which is very stable and easy to operate, and which simultaneously permits a very expedient stacking of the arrangements of shelves having in view the return transport of empty transport carriages.

According to the invention this is achieved by a transport carriage having a quadrangular chassis, a bushing of symmetrical, polygonal cross-section secured to each corner thereof, the carriage being further provided with wheels and removable shelves, each of said bushings being adapted to removably receive a column in two different positions, and said column having on one side a longitudinal slot and on another side a number of apertures, said slots and apertures being adapted to removably receive support means extending from the shelves.

When such a transport carriage is to be used for transport of objects, for example plants, columns are placed in each of the four bushings at the corners of the carriage, and these columns are placed so that the sides of the columns provided apertures are facing each other in pairs, thus permitting the mounting of shelves which are provided with support means fitting into said bores.

When a number of such transport carriages are to be returned without objects on the shelves, it is expedient that the transport carriages can be stacked in the most appropriate manner, and this can be achieved by removing the shelves from the carriages, and turning the columns on one of the carriages so that the longitudinal slots in the columns

will face each other in pairs. Now a large number of sleeves can be placed on this transport carriage, the support means being inserted into said slots so that the shelves can be stacked directly on top of each other.

Regarding the rest of the transport carriages the columns are removed, and these transport carriages can then be stacked on top of each other, the bushings in the corners resting directly on corresponding bushings on a carriage placed beneath. Thus, it will be possible to reduce a large number of transport carriages to two carriages, one of which being provided with columns carrying the shelves from all the carriages, while the other one consists of a number of carriages without columns and stacked on top of each other. It will even be possible to place the columns in a vertical position between these carriages, and the return transport of such empty carriages will therefore be very simple and inexpensive.

When shelves are to be placed on such a transport carriage it is expedient that there is a sufficient number of apertures in the columns so that the space available between the shelves can be varied according to the user's wishes. As the apertures thus must be located comparatively closely to each other it is important that it can easily be seen which apertures are placed opposite each other so as to ensure an accurate vertical positioning of the shelves and this is especially important for comparatively long shelves. With a view to this it is expedient according to the invention that the lower ends of said apertures are U or V shaped, while the top of successive apertures are of varying shape. This ensures that the shelves are correctly placed in the U or V shaped portions of the apertures, and also that it can easily be seen whether the two ends of a shelf are placed in bores having the same shape, thus ensuring that the shelf is mounted vertically.

To ensure that the carriages can be placed on top of each other in a safe and easy manner without any risk of mutual displacement, it

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is further expedient according to the invention that the transport carriage of the invention is constructed so that said bushings secured to the corners of the carriage are tapered downwardly and extend a distance beneath the chassis shorter than the total height of the wheel system and that the bushings extend a distance above the chassis of the carriage, said distance exceeding the distance between the lower portion of the bushings and the lower abutment face of the wheels. This ensures that there will be sufficient space for the wheels thus when stacking the carriages avoiding that a carriage rests on the wheels, and the tapered portion of each column will engage with the upwardly open bushing of a carriage placed beneath, so that the carriages will be effectively secured in relation to each other.

The invention will be described in greater detail below with reference to the accompanying drawings, wherein:—

fig. 1 shows a transport carriage according to the invention, and with wheels and an arrangement of shelves,

fig. 2 shows on a larger scale a corner of such a carriage with a shelf,

fig. 3 shows also a corner of such a carriage, but having the columns turned so as to make it suitable for receiving the support means of the shelf in the longitudinal slot, and

fig. 4 shows the corners of two carriages stacked on top of each other.

In fig. 1 a carriage is shown comprising a frame 1 with a shelf 2 placed on said frame and the corners of the frame are provided with bushings 3 into which columns 4 are inserted supporting a number of shelves 5 and the whole carriage is supported by wheels 6.

In fig. 2 is shown the lower corner of such a carriage where the column 4 is provided with apertures 7 and 8 on the side facing the shelf 5, and said shelf has support means 9 to be inserted into the apertures 7 or 8, said apertures 7 having a rounded edge at the top, while the apertures 8 are at the top. The opposite side of the column with rectangular profile has a longitudinal slot 10 and it appears from fig. 3 that shelves 5 can be placed directly on top of each other when turning the column 4, the lower-most of said shelves being supported by the support means

9 resting directly on the upper edge of the bushing 3.

Fig. 4 shows how the carriages can be stacked on top of each other, each bushing 3 ending downwardly in a pyramid-like pointed bushing 4 on a subjacent carriage. The height of these bushings is adapted so as to offer space for the wheels 6.

#### WHAT WE CLAIM IS:—

1. A transport carriage having a quadrangular chassis, a bushing of symmetrical, polygonal cross-section secured to each corner thereof, the carriage being further provided with wheels and removable shelves, each of said bushings being adapted to removably receive a column in two different positions, and said column having on one side a longitudinal slot and on another side a number of apertures, said slots and apertures being adapted to removably receive support means extending from the shelves.

2. A transport carriage according to Claim 1, wherein each bushing has a rectangular cross-section.

3. A transport carriage according to Claim 1 or Claim 2, wherein the longitudinal slot and the apertures are respectively on opposite sides of the column.

4. A transport carriage according to any one of the preceding claims, wherein the lower ends of said apertures are U or V shaped and the tops of successive apertures are of varying shape.

5. A transport carriage according to any one of the preceding claims, wherein said bushings secured to the corners of the carriage are tapered downwardly, extend a distance beneath the chassis shorter than the total projection of the wheels, and extend a distance above the chassis of the carriage which exceeds the distance between the lower portion of the bushings and the lower extremity of the wheels.

6. A transport carriage substantially as hereinbefore described with reference to the accompanying drawings.

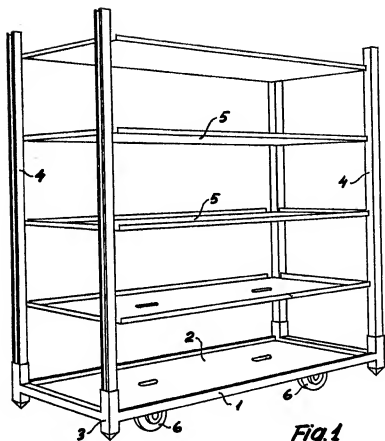
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Sheet 1



*Fig.1*

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## COMPLETE SPECIFICATION

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Sheet 3

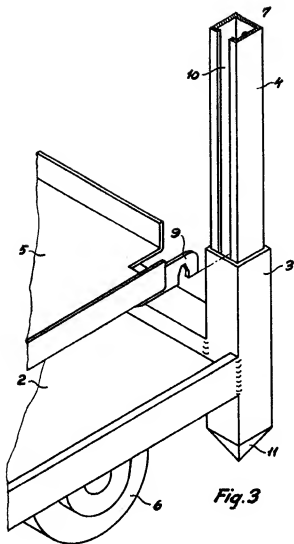


Fig. 3

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